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Attorney Docket No. 577-175 (RSW9-99-064)

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: Dickson et al.

Application No.: 09/396,873

Filed: September 15, 1999

For: PROTECTING SECRET DATA ENTRY FROM INFRARED AND AUDIO  
EAVESDROPPING

Confirmation No.: 8033

Group Art Unit: 2134

Examiner: Christopher J. Brown

Date: February 21, 2006

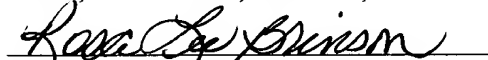
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Rosa Lee Brinson

**TRANSMITTAL OF APPEAL BRIEF  
(PATENT APPLICATION--37 C.F.R. § 41.37)**

1. Transmitted herewith is the Notice of Appeal for the above-identified application, pursuant to the Notice of Appeal filed on December 22, 2005.

2. This application is filed on behalf of  
☐ a small entity.

3. Pursuant to 37 C.F.R. § 41.20(b)(2), the fee for filing the Appeal Brief is:  
☐ small entity \$250.00  
☒ other than small entity \$500.00


Appeal Brief fee due \$500.00

☒ The Commissioner is authorized to charge IBM Deposit Account No. 09-0461 in the amount of \$500.00 for the Appeal fee as provided by 37 C.F.R. § 41.20(b)(2).

☒ Any additional fee or refund may be charged to Deposit Account 09-0461.

Myers Bigel Sibley & Sajovec, P.A.  
P. O. Box 37428  
Raleigh, North Carolina 27627  
Telephone: (919) 854-1400  
Facsimile: (919) 854-1401  
Customer No. 20792

Respectfully submitted,

  
Julie H. Richardson  
Registration No. 40,142



Attorney Docket No. 5577-175 (RSW9-99-064)

PATENT

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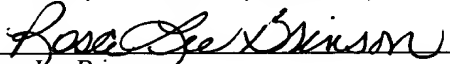
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Rosa Lee Brinson

**APPELLANTS' BRIEF ON APPEAL UNDER 37 C.F.R. § 41.37**

Sir:

This Appeal Brief is filed pursuant to the "Notice of Appeal to the Board of Patent Appeals and Interferences" filed on December 22, 2005.

**REAL PARTY IN INTEREST**

The real party in interest is International Business Machines Corporation, Armonk, New York, pursuant to the Assignment from the inventors recorded at the U.S. Patent and Trademark Office on September 15, 1999 on reel number 010248 and frame number 0536.

**RELATED APPEALS AND INTERFERENCES**

Appellants are aware of no appeals or interferences that would be affected by the present appeal.

**STATUS OF CLAIMS**

Claims 2-13, 15-24, 26-32 and 34-39 are pending in the present application as of the filing of this Brief, Claim 38 is allowed in the present application as of the filing of this Brief, and Claim 18 is objected to in the present application as of the filing of this Brief. As of the filing date of this Brief, Claims 2-7, 9-12, 23, 24, 26-28 and 30-32 stand rejected under 35

U.S.C. § 102(e) as anticipated by U.S. Patent No. 5,828,034 to Chang (Chang) in the Final Office Action dated November 2, 2005 (the Final Action). Claims 15, 19-21, 23, 34 and 39 stand rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,075,606 to Lipman (Lipman). Claims 15, 17, 23, 34, 36 and 37 stand rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 4,052,720 to McGregor et al. (McGregor) in view of U.S. Patent No. 5,611,608 to Clausen (Clausen). Claim 8 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Chang. Claims 13 and 29 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Chang in view of U.S. Patent No. 4,727,655 to Jacobi, Jr. (Jacobi). Claim 21 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Chang in view of Lipman. Claims 16, 22 and 34-36 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Chang in view of U.S. Patent No. 6,232,994 to Wiklof (Wiklof). Appellants appeal the final rejection of Claims 2-13, 15-17, 19-24, 26-32, 34-37 and 39.

#### **STATUS OF AMENDMENTS**

The Appendix of Claims submitted herewith reflects the state of the claims of record as entered after the amendments made thereto in Appellants' Reply with Amendment in Support of Request to Reopen Prosecution Pursuant to 37 C.F.R. § 41.39(b)(1) and 37 C.F.R. § 1.111 filed March 21, 2005.

#### **SUMMARY OF CLAIMED SUBJECT MATTER**

In today's emerging information society, more and more personal and proprietary information is stored in electronic databases. To prevent unauthorized access to these private databases, many electronic systems, computers, and networks require users to enter secret data to initialize a security relationship. While efforts have been made to utilize biological characteristics as secret data, through methods such as voice identification or retinal scanning, widespread use of these methods may be years, if not decades, away. The predominant method for providing secret data remains the use of a data entry device, typically a keyboard or keypad, to enter secret data, such as a password or PIN (Personal Identification Number). Entry of the proper secret data initializes a security relationship. *See* Specification, p. 1, lines 6-15.

A password or PIN may be stolen in several ways including detecting the keypad or keyboard using a physical sensor while the user enters his or her password or PIN or tapping into the electrical circuit or network downstream from the keypad or keyboard to capture the password or PIN after the user has entered it into the keypad or keyboard. Previous efforts have been focused on protecting PINs and passwords from this latter form of compromise; however, little work has focused on detection of secret data entry by physical sensors. *See* Specification, p. 2, lines 26-32.

The present application includes rejected independent Claims 2, 15, 22, 23 and 34 and separately patentable dependent Claims 7, 32, 39, 8, 13, 29, 21, 16, 35 and 36. The claims are method and system claims.

Independent Claim 2 is directed to a method for protecting data entry to a data entry device (such as data entry device **10** in **Figure 2**) from eavesdropping. Such a method may be provided by masking a signature of entry resulting from entry of data by a user of the data entry device so as to reduce the detectability of the signature by eavesdropping. *See* Specification, p. 5, lines 28-31. The signature may include a temperature differential in the data entry device from data entry by the user and masking the signature may include various systems for masking temperature differentials to reduce detectability. *See* Specification, p. 5, lines 32-33, p. 8, lines 6-7. For example, the masking may include controlling the external temperature of the data entry device to reduce a temperature differential in the data entry device from data entry by the user. *See* Specification, p. 5, line 33, p. 6, lines 1-2. The temperature may be controlled by cooling or heating. *See* Specification, p. 6, lines 5-6, Figures 3-6.

Independent Claim 23 is a system corresponding to Claim 2. The means for establishing an external temperature of the data entry device to reduce temperature differentials left in the data entry device by the user may include a feedback control circuit (*see* Specification, p. 8, lines 8-33, p. 9, lines 1-4, Figure 3), a temperature sensor (*see* Specification, p. 8, lines 9-12, 14-15; *see* **30** in **Figure 3**), a convection device operably associated with the data entry device so as to maintain the external temperature in a range surrounding a predetermined setpoint (*see* Specification, p. 9, lines 26-33, p. 10, lines 1-8, Figure 5), a blower (*see* Specification, p. 9, lines 27-28; *see* **50** in **Figure 5**), a thermal curtain

or barrier stream of air (*see* Specification, p. 9, line 33, p. 10, lines 1-3), a resistive heating source operably associated with the data entry device so as to maintain the external temperature in a range surrounding a predetermined setpoint (*see* Specification, p. 9, lines 11-25, Figure 4), a resistive heating element (*see* Specification, p. 9, lines 14-19; *see* **40** in **Figure 4**), a radiant heat source operably associated with the data entry device so as to maintain the external temperature in a range surrounding a predetermined setpoint (*see* Specification, p. 10, lines 9-22, Figure 6), an infrared emitting lamp (*see* Specification, p. 10, lines 10-11; *see* **60** in **Figure 6**), or any other known means for providing cooling or heating to a data entry device. *See* Specification, p. 8, lines 6-7, Figures 3-6.

Dependent Claim 7 is directed to the method corresponding to Claim 2. The external temperature of the data entry device (such as data entry device **10** in **Figure 2**) may be controlled by maintaining the external temperature in a range surrounding a predetermined setpoint through monitoring the external temperature of the data entry device to provide a device temperature and adjusting the output of the temperature control mechanism responsive to the device temperature so as to maintain the device temperature at approximately the setpoint. *See* Specification, p. 6, lines 3-5.

Dependent Claim 32 is directed to the system corresponding to Claim 23. A feedback control circuit (*see* Specification, p. 8, lines 8-33, p. 9, lines 1-4, Figure 3) may establish the external temperature of the data entry device. The feedback control circuit may provide a closed loop feedback control of the temperature. The feedback control circuit may include a temperature sensor (such as temperature sensor **30** in **Figure 3**) operably associated with the data entry device (such as data entry device **10** in **Figure 3**) so as to measure the external temperature of the data entry device and a control circuit (such as control circuit **31** in **Figure 3**) operably associated with the temperature sensor and with means for controlling temperature (such as heating/cooling device **32** in **Figure 3**) so as to control the feedback control circuit based on the sensed temperature. The means for controlling temperature may include a heating/cooling device such as a thermal curtain or barrier stream of air (*see* Specification, p. 9, line 33, p. 10, lines 1-3), a blower (such as blower **50** in **Figure 5**), a resistive heating element (such as resistive heating element **40** in **Figure 4**), an infrared

emitting lamp (such as infrared emitting lamp **60** in **Figure 6**), or any other known means for providing cooling or heating to a data entry device. *See* Specification, p. 8, lines 16-18.

Independent Claim 15 is directed to a method for protecting data entry to a data entry device from eavesdropping, and such a method may be provided by masking a signature of entry resulting from entry of data by a user of the data entry device so as to reduce the detectability of the signature by eavesdropping. *See* Specification, p. 5, lines 28-31. The signature may include sound waves emitted from the data entry device and the masking may also include masking sound waves emitted from the data entry device to reduce the detectability of the sound waves. *See* Specification, p. 6, lines 9-12. The masking of sound waves may include generating an interfering sound pattern so as to reduce the detectability of the sound waves. *See* Specification, p. 6, lines 13-14.

Independent Claim 34 is a system corresponding to Claim 15. The means for generating an interfering sound pattern so as to reduce the detectability of the sound waves may include a noise cancellation circuit (*see* Specification, p. 10, lines 30-33, p. 11, lines 1-17; *see* **71** in **Figure 7**) which cancels the sound waves emitted by the data entry device (such as data entry device **10** in **Figure 7**), a sound generator (*see* Specification, p. 11, lines 18-28; *see* **80** in **Figure 8**) operably associated with the data entry device so as to generate an interfering sound pattern so as to reduce the detectability of the sound waves, a speaker which emits pre-recorded sounds (*see* Specification, p. 11, lines 21-28), a blower, or any other known means for generating an interfering sound pattern. *See* Specification, p. 10, lines 28-29.

Dependent Claim 39 is directed to the system corresponding to Claim 34. A sound generator (such as sound generator **80** in **Figure 8**) may be operably associated with the data entry device so as to generate an interfering sound pattern so as to reduce the detectability of the sound waves. The sound generator may include a blower which disrupts the sound waves by blowing a stream of air in proximity to the data entry device.

Dependent Claim 8 is directed to the method corresponding to Claim 2. The external temperature of the data entry device (such as data entry device **10** in **Figure 2**) may be controlled by maintaining the external temperature in a range surrounding a predetermined

setpoint. *See* Specification, p. 6, lines 3-5. The predetermined setpoint may be between about 35-40° C. *See* Specification, p. 6, line 5.

Dependent Claim 13 is directed to the method corresponding to Claim 2. The external temperature of the data entry device (such as data entry device **10** in **Figure 2**) may be controlled by utilizing radiation. *See* Specification, p. 10, lines 9-10. Utilizing radiation may include emitting heat from an infrared-emitting lamp (such as infrared emitting lamp **60** in **Figure 6**) in proximity to the data entry device.

Dependent Claim 29 is directed to the system corresponding to Claim 23. A radiant heat source may be operably associated with the data entry device (such as data entry device **10** in **Figure 6**) so as to maintain the external temperature in a range surrounding the predetermined setpoint. The radiant heat source may include an infrared emitting lamp (such as infrared emitting lamp **60** in **Figure 6**) which radiates heat **61** in proximity to the data entry device.

Dependent Claim 21 is directed to a method for protecting data entry to a data entry device from eavesdropping, and such a method may be provided by masking a signature of entry resulting from entry of data by a user of the data entry device so as to reduce the detectability of the signature by eavesdropping. *See* Specification, p. 5, lines 28-31. A blower (such as blower **50** in **Figure 5**) may generate an interfering pattern by providing background noise to mask sound waves emitted from the data entry device (such as data entry device **10** in **Figure 5**). The blower may also blow a stream of temperature-controlled air **51** in proximity to the data entry device controlling the external temperature of the data entry device to reduce temperature differentials left in the data entry device by the user. *See* Specification, p. 9, lines 27-33.

Dependent Claim 16 is directed to the method corresponding to Claim 15. An interfering pattern may be generated by receiving the signature, converting the signature to an electrical signal, phase-shifting the electrical signal, converting the phase-shifted electrical signal to an audio signal, and emitting the audio signal in close proximity to the data entry device. *See* Specification, p. 6, lines 15-18.

Independent Claim 22 is directed to a method for protecting data entry to a data entry device from eavesdropping, and such a method may be provided by masking a signature of

entry resulting from entry of data by a user of the data entry device so as to reduce the detectability of the signature by eavesdropping. *See* Specification, p. 5, lines 28-31. The signature may include sound waves emitted from the data entry device. *See* Specification, p. 6, lines 9-10. The masking may include providing a sound-dampening device on the data entry device.

Dependent Claim 35 is directed to the system corresponding to Claim 34. A noise cancellation circuit (such as noise cancellation circuit **71** in **Figure 7**) may generate an interfering sound pattern. The noise cancellation circuit may cancel the sound waves emitted by the data entry device (such as data entry device **10** in **Figure 7**). The noise cancellation circuit may include a microphone (such as microphone **70** in **Figure 7**) operably associated with a data entry device so as to receive sound waves produced by the entering of data into a data entry device by a user, a converting means (such as microphone **70** in **Figure 7**) operably associated with the microphone so as to convert the sound waves to an electrical signal, a phase-shifting means operably associated with the converting means so as to shift the phase of the electrical signal to produce a phase-shifted electrical signal, a converting means (such as speaker **72** in **Figure 7**) operably associated with the phase-shifting means so as to convert the phase-shifted electrical signal to an audio signal, and an emitting means (such as speaker **72** in **Figure 7**) operably associated with the converting means so as to emit sound waves (such as sound waves **73** in **Figure 7**) corresponding to the audio signal in close proximity to the data entry device. The phase-shifting means may include an adaptive digital signal processor such as those known to those skilled in the art. *See* Specification, p. 11, lines 5-6.

Dependent Claim 36 is directed to the system corresponding to Claim 34. A sound generator (such as sound generator **80** in **Figure 8**) may be operably associated with the data entry device so as to generate an interfering sound pattern so as to reduce the detectability of sound waves.

**GROUND OF REJECTION TO BE REVIEWED ON APPEAL**

1. Whether Claims 2-7, 9-12, 23, 24, 26-28 and 30-32 are properly rejected under 35 U.S.C. § 102(e) as anticipated by Chang.



2. Whether Claims 15, 19-21, 23, 34 and 39 are properly rejected under 35 U.S.C. § 102(b) as anticipated by Lipman.
3. Whether Claims 15, 17, 23, 34, 36 and 37 are properly rejected under 35 U.S.C. § 103(a) as unpatentable over McGregor in view of Clausen.
4. Whether Claim 8 is properly rejected under 35 U.S.C. § 103(a) as unpatentable over Chang.
5. Whether Claims 13 and 29 are properly rejected under 35 U.S.C. § 103(a) as unpatentable over Chang in view of Jacobi.
6. Whether Claim 21 is properly rejected under 35 U.S.C. § 103(a) as unpatentable over Chang in view of Lipman.
7. Whether Claims 16, 22 and 34-36 are properly rejected under 35 U.S.C. § 103(a) as unpatentable over Chang in view of Wiklof.

## ARGUMENT

### **I. Introduction**

#### **A. Legal Standards for Anticipation**

Under 35 U.S.C. § 102, "a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." M.P.E.P. § 2131 (quoting *Verdegaal Bros. v. Union Oil Co.*, 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987)). "The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.'" M.P.E.P. § 2112 (citations omitted) (emphasis added).

A finding of anticipation further requires that there must be no difference between the claimed invention and the disclosure of the cited reference as viewed by one of ordinary skill in the art. See *Scripps Clinic & Research Foundation v. Genentech Inc.*, 18 U.S.P.Q.2d 1001 (Fed. Cir. 1991). Thus, anticipation requires that a single prior art reference disclose each

and every element of the anticipated claim.

*B.      Legal Standards for Obviousness*

A determination under § 103 that an invention would have been obvious to someone of ordinary skill in the art is a conclusion of law based on fact. *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1593, 1 U.S.P.Q.2d 1593 (Fed. Cir. 1987), *cert. denied*, 107 S.Ct. 2187. After the involved facts are determined, the decision maker must then make the legal determination of whether the claimed invention as a whole would have been obvious to a person having ordinary skill in the art at the time the invention was made. *See Panduit*, 810 F.2d at 1596. The United States Patent and Trademark Office (USPTO) has the initial burden under § 103 to establish a *prima facie* case of obviousness. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988).

To establish a *prima facie* case of obviousness, the prior art reference or references when combined must teach or suggest *all* the recitations of the claims, and there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. *See* M.P.E.P. § 2143. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *See* M.P.E.P. § 2143.01(citing *In re Mills*, 916 F.2d 680, 16 U.S.P.Q.2d 1430 (Fed. Cir. 1990)). As emphasized by the Court of Appeals for the Federal Circuit, to support combining references, evidence of a suggestion, teaching, or motivation to combine must be clear and particular, and this requirement for clear and particular evidence is not met by broad and conclusory statements about the teachings of references. *In re Dembiczak*, 175 F.3d 994, 999, 50 U.S.P.Q.2d 1614, 1617 (Fed. Cir. 1999). In another decision, the Court of Appeals for the Federal Circuit has stated that, to support combining or modifying references, there must be particular evidence from the prior art as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed. *In re Kotzab*, 217 F.3d 1365, 1370, 55 U.S.P.Q.2d 1313, 1317 (Fed. Cir. 2000).

Furthermore, as stated by the Federal Circuit with regard to the selection and combination of references:

This factual question of motivation is material to patentability, and could not be resolved on subjective belief and unknown authority. It is improper, in determining whether a person of ordinary skill would have been led to this combination of references, simply to "[use] that which the inventor taught against its teacher." W.L. Gore v. Garlock, Inc., 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983). Thus the Board must not only assure that the requisite findings are made, based on evidence of record, but must also explain the reasoning by which the findings are deemed to support the agency's conclusion....

*In re Sang Su Lee*, 61 U.S.P.Q.2d 1430, 1434, 277 F.3d 1338, 1343 (Fed. Cir. 2002).

The patentability of the pending claims is discussed further below.

## **II. Rejections under Section 102(e) based on Chang**

### **A. Independent Claims 2 and 23 are Patentable over Chang**

Claims 2-7, 9-12, 23, 24, 26-28 and 30-32 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Chang. The Final Action alleges that Chang anticipates the data entry heat masking claims because Chang proposes a heated keyboard (for cold environments). The Final Action admits that the heating element in the instant application is used for a different purpose than the heating element of Chang. However, the Final Action goes on to state that "the applicant does not claim eavesdropping or a feedback control based on detectability of thermal imprints." The Final Action p. 2, line 5 (*emphasis added*).

Notably, however, Claims 2 and 23 do indeed recite the eavesdropping feature. Claim 2 recites:

**A method for protecting data entry to a data entry device from eavesdropping**, wherein a signature of data entry comprises a temperature differential in the data entry device from data entry by the user, comprising:  
masking the signature of data entry resulting from entry of data by a user of the data entry device so as to **reduce the detectability of the signature through eavesdropping** by controlling the external temperature of the data entry device to reduce temperature differentials left in the data entry device by the user.

Claim 23 recites:

**A system for protecting data entry to a data entry device from eavesdropping** comprising:

a data entry device, and  
means for establishing the external temperature of the  
data entry device to reduce temperature differentials left in the  
data entry device by the user so as to mask signature of entry  
resulting from entry of data by a user of the data entry device  
to **reduce the detectability of a thermal signature by  
eavesdropping.**

Appellants acknowledge that Chang warms the keyboard to keep a user's hands and fingers warm and comfortable, but the heat is for use "in cold environments." Chang, Abstract. Similar to heated car seats and steering columns (and as expressly stated by Chang), Appellants submit that the heat feature of Chang is used when the external temperatures are cold, and such a feature does not teach or suggest using thermal control for data masking to prevent or inhibit eavesdropping. Appellants submit that most users find ambient temperature keyboards in conventional use environments to be comfortable and would not employ heated keyboards unless it was for masking to reduce the detectability of a thermal signature.

Furthermore, the heated keyboard proposed by Chang allows the user to set the temperature based on "comfort." Chang, col. 6, lines 5-14. Allowing user control based on personal comfort provides further uncertainty in the ability to thermally mask data entry. With respect to monitoring external temperature of the device to provide the thermal masking, the Final Action states that Chang proposes an internal sensor and concludes that external sensing is the same as internal sensing. The Final Action, p. 4, lines 2-7. However, the internal sensor of Chang is used to maintain a user-set temperature for comfort, not thermal masking of a thermal signature associated with keypad entry. Monitoring for temperature to reduce temperature differentials in different keypads is different than monitoring for maintaining a comfort temperature. Appellants submit that controlling the temperature of the heating element to a user-defined "comfort" temperature would not inherently mask a signature of data entry, particularly when such use is typically in a cold environment.

In view of the foregoing, Appellants respectfully submit that independent Claims 2 and 23 and the claims that depend from them are neither disclosed nor suggested by Chang,

either literally or inherently, for at least these reasons. Thus, Appellants respectfully request that the rejections of Claims 2-7, 9-12, 23, 24, 26-28 and 30-32 be reversed.

*B. Dependent Claims 7 and 32 are Separately Patentable*

Claims 7 and 32 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Chang. While Appellants submit that Claims 7 and 32 are patentable as depending from a patentable base claim, Appellants also submit that Claims 7 and 32 are separately patentable over the cited references. Claim 7 recites "monitoring the external temperature of the data entry device to provide a device temperature" and "adjusting the output of a temperature control mechanism responsive to the device temperature so as to maintain the device temperature at approximately the setpoint." Appellants submit that Chang does not disclose or suggest monitoring the external temperature of the device and adjusting a temperature control mechanism to maintain the device temperature. Similar recitations are found in Claim 32. Appellants submit that Claims 7 and 32 are separately patentable for at least these additional reasons. Thus, Appellants respectfully request that the rejections of Claims 7 and 32 be reversed.

**III. Rejections under Section 102(b) based on Lipman**

*A. Independent Claims 15 and 34 are Patentable over Lipman*

Claims 15, 19-21, 34 and 39 stand rejected under 35 U.S.C. § 102(b) as anticipated by Lipman. Lipman is directed to a solid state DC fan motor, but the DC fan motor of Lipman does not teach a data entry device. Moreover, although the Final Action alleges that "the applicant does not claim eavesdropping, or complete masking of data entry sounds" (the Final Action p. 3, line 2, p.3, line 10 (emphasis added)), independent Claims 15 and 34 do indeed recite the eavesdropping feature. Claim 15 recites:

**A method for protecting data entry to a data entry device from eavesdropping**, wherein a signature of data entry comprises sound waves emitted from the data entry device, comprising:  
**masking the signature of data entry resulting from entry of data by a user of the data entry device so as to reduce the detectability of the signature through eavesdropping by**

**generating an interfering sound pattern** so as to reduce the detectability of the sound waves.

Claim 34 recites:

**A system for protecting data entry to a data entry device from eavesdropping** comprising:  
a data entry device, and  
means for generating an interfering sound pattern so as to reduce the detectability of sound waves **emitted from the data entry device so as to mask a signature of data entry resulting from entry of data by a user of the data entry device to reduce the detectability of an audio signature by eavesdropping.**

Conversely, there is nothing in the cited portion of Lipman that discloses or suggests that the fan of Lipman is noisy and located in proximity of an input device such that any generated sound would mask a signature of data entry. Furthermore, even if noisy, unless the noise is at the correct frequency, such that it would mask data entry noises, the mere presence of noise would not necessarily nor reliably result in the masking recited in Claims 15 or 34. In fact, nothing in the cited portion of Lipman discloses or suggests masking data entry as recited in Claims 15 and 34. Appellants submit that, merely because something can be noisy, that does not disclose the recitations of the independent claims. Accordingly, Appellants respectfully submit that Claims 15 and 34 and the claims that depend from them are neither disclosed nor suggested by the cited portions of Lipman for at least these reasons. Thus, Appellants respectfully request that the rejections of Claims 15, 19-21, 34 and 39 be reversed.

*B. Independent Claim 23 is Patentable*

Claim 23 stands rejected under 35 U.S.C. § 102(b) as anticipated by Lipman. However, the DC fan motor of Lipman fails to teach thermal masking or a heated keyboard. Moreover, Claim 23 is improperly grouped with the rejections of "sound" masking. Lipman does not anticipate Claim 23, as Lipman does not teach a data entry device, much less heating or cooling a data entry device. In addition, Claim 23 is not obvious based on the "sound"

references at page 6 of the Final Action. Accordingly, Appellants respectfully submit that Claim 23 is neither disclosed nor suggested by the cited portions of Lipman for at least these reasons. Thus, Appellants respectfully request that the rejection of Claim 23 be reversed.

*C. Dependent Claim 39 is Separately Patentable*

Claim 39 stands rejected under 35 U.S.C. § 102(b) as anticipated by Lipman. While Appellants submit that Claim 39 is patentable as depending from a patentable base claim, Appellants also submit that Claim 39 is separately patentable over the cited references. Claim 39 recites that "the sound generator comprises a blower which disrupts the sound waves by blowing a stream of air in proximity to the data entry device." Appellants submit that the DC fan of Lipman does not disclose or suggest a blower that disrupts sound waves as is recited in Claim 39. As such, Appellants submit that Claim 39 is separately patentable for at least these additional reasons. Thus, Appellants respectfully request that the rejection of Claim 39 be reversed.

**IV. Rejections under Section 103(a) based on McGregor and Clausen**

*A. Independent Claims 15 and 34 are Patentable over McGregor and Clausen*

Claims 15, 17, 34, 36 and 37 stand rejected under 35 U.S.C. § 103(a) as being obvious over McGregor in view of Clausen. The cited portion of McGregor describes noise control that combines a generated noise and music. However, nothing in the cited portion of McGregor discloses or suggests that such generated noise and music be used to mask a signature of data entry as recited in independent Claims 15 and 34. Accordingly, Appellants submit that McGregor does not disclose or suggest the recitations of Claims 15 and 34 or the claims that depend from them for at least these reasons.

Moreover, the Final Action concedes that McGregor does not teach a computer in an office. The Final Action p. 7, line 7. Nonetheless, the Final Action states that:

Clausen teaches an office desk designed for use with computers, (Fig. 11, 15, 16). It is well known that offices have computers, and computers have data entry devices. It would have been obvious to one of ordinary skill in the art to modify the system of McGregor in an office with the computer desk

and computers of Clausen to maximize productivity and ergonomic value, (Col. 2 lines 61-66).

The Final Action, p. 7, lines 8-12. However, even modified, the cited references would not render a system for masking data entry of a computer or data entry device. If the random noise from room speakers from McGregor were sufficiently loud to mask data entry from computers in an office, the noise would not be "ergonomic" and would likely not "maximize productivity," which is the alleged motivation to combine the references. Therefore, Appellants respectfully submit that there is no motivation to modify the references in the manner alleged by the Final Action absent the teachings of the instant invention and that, even combined, the references fail to teach or suggest the claimed subject matter. Accordingly, Appellants respectfully request that the rejections of Claims 15, 17, 34, 36 and 37 be reversed.

*B. Dependent Claims 36 and 37 are Separately Patentable*

Claims 36 and 37 stand rejected under 35 U.S.C. § 103(a) as being obvious over McGregor in view of Clausen. Appellants submit that Claims 36 and 37 are patentable as depending from a patentable base claim. Appellants also submit that Claim 36 and 37 are separately patentable over the cited references. As stated above, even modified, McGregor and Clausen would not render a system for masking data entry of a computer or data entry device. Moreover, the alleged combination would not render a system for masking data entry that includes a sound generator that is operably associated with the data entry device, as is included in the systems of Claims 36 and 37. Therefore, Appellants respectfully submit for at least these additional reasons that there is no motivation to modify the references in the manner alleged by the Final Action absent the teachings of the instant invention and that, even combined, the references fail to teach or suggest the claimed subject matter. Accordingly, Appellants respectfully request that the rejections of Claims 36 and 37 be reversed.

*C. Independent Claim 23 is Patentable*



Claim 23 stands rejected under 35 U.S.C. § 103(a) as being obvious over McGregor in view of Clausen. However, Claim 23 is improperly grouped with the rejections of "sound" masking. Nothing in the cited portion of McGregor discloses or suggests that the generated noise and music be used to mask a signature of data entry, much less to mask a thermal signature of data entry, as recited in independent Claim 23. Therefore, Appellants respectfully submit that there is no motivation to modify the McGregor and Clausen in the manner alleged by the Final Action and that, even combined, the references fail to teach or suggest the claimed subject matter. Thus, Appellants respectfully request that the rejection of Claim 23 be reversed.

**V. Dependent Claim 8 is Patentable over Chang**

Claim 8 stands rejected under 35 U.S.C. § 103(a) as being obvious in light of Chang. Appellants submit that Claim 8 is patentable at least per its base claim. Furthermore, as Chang does not relate to masking a signature of data entry, Appellants submit that there would be no reason to modify Chang to perform such a function.

The Final Action improperly states that Chang proposes a range of temperatures from room temperature to 120° F and cites column 3, line 46 of Chang to support the allegation. The Final Action, p. 4, lines 8-9. However, a closer look at this passage shows that Chang merely states that a designer should use internal signal processing circuitry components that can withstand variations in temperatures ranging to 120° F. The internal temperature of the circuit components does not equate to the temperature of keys at the keypad. There is no teaching of using the temperatures recited in Claim 8 for data entry keypad temperatures, much less for thermal masking. Appellants were unable to find any support for the allegation that Chang proposes a "range of temperatures from room temperature to 120° F". Indeed, Chang is directed for use in cold environments where "room temperature" would be cold. Chang, Abstract.

Thus, Chang does not teach or suggest the recited temperatures, and absent the teachings of the instant invention a data entry device would not use a middle range "closer to human body temperature than room temperature" as alleged in the Final Action. See the Final Action, p. 4, lines 9-11. Therefore, Appellants respectfully submit that Claim 8 is

patentable over Chang for at least these reasons and respectfully request that the rejection of Claim 8 be reversed.

**VI. Dependent Claims 13 and 29 are Patentable over Chang and Jacobi**

Claims 13 and 29 stand rejected under 35 U.S.C. § 103(a) as being obvious in light of Chang and Jacobi. Appellants submit that Claims 13 and 29 are patentable as depending from a patentable base claim. Appellants further submit that, as Chang does not relate to masking data entry, there would be no reason or motivation to modify Chang to perform such a function.

Additionally, Jacobi describes a dryer for printed materials. See Jacobi, col. 2, lines 30-32. Appellants submit that, absent the teachings of the instant invention, one of skill in the art would not look to the heat lamp assembly of Jacobi that is used for drying coated printed materials to combine with the keyboard of Chang to result in the recitations of Claims 13 or 29. The Final Action's stated motivation for combining Jacobi and Chang to result in the recitations of Claims 13 and 29 is "because the lamp is economical and efficient." The Final Action, p. 4, line 18. However, such a motivation is a conclusory assertion that does not provide a proper motivation to combine Jacobi with Chang. Furthermore, there is no indication of how the heat lamp assembly of Jacobi could even be used with the keyboard of Chang. Accordingly, Appellants respectfully submit that Claims 13 and 29 are separately patentable over the cited references for at least these additional reasons. Thus, Appellants respectfully request reversal of the rejections of Claims 13 and 29.

**VII. Dependent Claim 21 is Patentable over Lipman and Chang**

Claim 21 stands rejected under 35 U.S.C. § 103(a) as being obvious in light of Chang and Lipman. Appellants submit that Claim 21 is patentable at least per the patentability of its base claim. Appellants further submit that the combination of Chang and Lipman does not result in the recitations of Claim 21 and that such a conclusion can only be arrived at through the impermissible use of hindsight. The alleged combination of Chang and Lipman would apparently provide a computer with a heated keyboard and a noisy fan. In response to

Appellants' previous submission of the use of hindsight to combine the unrelated references, the Final Action states that:

it must be recognized that any judgment on obviousness is in a sense necessarily based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper.

The Final Action, p. 5, lines 2-6.

However, as discussed above, neither Chang nor Lipman relate to masking of data entry, and neither describe a blower that blows a stream of temperature-controlled air in proximity to the data entry device controlling the external temperature of the data entry device to reduce temperature differentials left in the data entry device by the user. Thus, neither Lipman nor Chang are directed to solving the problem solved by the present invention. Accordingly, one of skill in the art would not be motivated to combine the unrelated teachings of Lipman with those of Chang to result in the recitations of Claim 21. Appellants, therefore, respectfully submit that Claim 21 is separately patentable for at least these reasons. Thus, Appellants respectfully request the rejection of Claim 21 be reversed.

**VIII. Independent Claims 22 and 34 and Dependent Claims 16, 35 and 36 are Patentable over Chang and Wiklof**

Claims 16, 22 and 34-36 stand rejected under 35 U.S.C. § 103(a) as being obvious in light of Chang and Wiklof. Appellants submit that Claims 16, 35 and 36 are patentable at least per the patentability of their base claims. In addition, Appellants submit that the combination of Chang and Wiklof does not result in the recitations of Claims 16, 22 and 34-36.

Chang proposes warming a keypad for a cold environment. Wiklof is directed to noise cancellation for a noisy thermal printer using a microphone for receiving sound signals therefrom and an inversion circuit to cancel noise. Appellants submit that there is no motivation to combine the noisy thermal printer noise cancellation systems onto a data entry

device absent the teachings of the instant invention, because, *inter alia*, unlike the printer, the data entry device is not noisy.

Thus, one of skill in the art would not be motivated to combine the unrelated teachings of Chang with those of Wiklof to result in the recitations of Claims 16, 22 and 34-36. Accordingly, Appellants respectfully submit that Claims 16, 22 and 34-36 are patentable for at least these additional reasons and respectfully request the rejections of Claims 16, 22 and 34-36 be reversed.

**IX. Allowable Subject Matter**

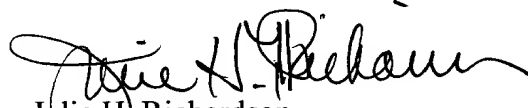
Appellants note that the Final Action states that dependent Claim 18 contains allowable subject matter. The Final Action, p. 9, line 11.

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**CONCLUSION**

On the entire record, Appellants submit that Claims 2-13, 15-24, 26-32, 34-39 are patentable over the cited references. Accordingly, it is respectfully requested that the Examiner's conclusions be reversed, and that this case be passed to issuance.

Respectfully submitted,

  
Julie H. Richardson  
Registration No. 40,142

Myers Bigel Sibley & Sajovec, P.A.  
Post Office Box 37428  
Raleigh, NC 27627  
Telephone (919) 854-1400  
Facsimile (919) 854-1401

**CLAIMS APPENDIX**

1. Cancelled.

2. (Previously Presented) A method for protecting data entry to a data entry device from eavesdropping, wherein a signature of data entry comprises a temperature differential in the data entry device from data entry by the user, comprising:

masking the signature of data entry resulting from entry of data by a user of the data entry device so as to reduce the detectability of the signature through eavesdropping by controlling the external temperature of the data entry device to reduce temperature differentials left in the data entry device by the user.

3. (Previously Presented) A method according to Claim 2 wherein the data entry device is a keyboard.

4. (Previously Presented) A method according to Claim 2 wherein the data entry device has external surfaces that are thermally conductive.

5. (Previously Presented) A method according to Claim 2 wherein the data entry device has external surfaces that are thermally resistive.

6. (Original) A method according to Claim 2 wherein the step of controlling comprises the step of maintaining the external temperature in a range surrounding a predetermined setpoint.

7. (Original) A method according to Claim 6 wherein the step of maintaining the external temperature comprises the steps of:

monitoring the external temperature of the data entry device to provide a device temperature, and

adjusting the output of a temperature control mechanism responsive to the device temperature so as to maintain the device temperature at approximately the setpoint.

8. (Original) A method according to Claim 6 wherein the predetermined setpoint is between 35-40 °C.

9. (Original) A method according to Claim 2 wherein the controlling step comprises the step of controlling the external temperature utilizing conduction.

10. (Original) A method according to Claim 2 wherein the controlling step comprises the step of controlling the external temperature utilizing convection.

11. (Original) A method according to Claim 10 wherein the step of controlling the external temperature utilizing convection comprises blowing a stream of temperature-controlled air in proximity to the data entry device.

12. (Original) A method according to Claim 2 wherein the controlling step comprises the step of controlling the external temperature utilizing radiation.

13. (Original) A method according to Claim 12 wherein the step of controlling the external temperature utilizing radiation comprises emitting heat from an infrared-emitting lamp in proximity to the data entry device.

14. Cancelled.

15. (Previously Presented) A method for protecting data entry to a data entry device from eavesdropping, wherein a signature of data entry comprises sound waves emitted from the data entry device, comprising:

masking the signature of data entry resulting from entry of data by a user of the data entry device so as to reduce the detectability of the signature through eavesdropping by generating an interfering sound pattern so as to reduce the detectability of the sound waves.

16. (Original) A method according to Claim 15 wherein the step of generating comprises the steps of:

- receiving the signature,
- converting the signature to an electrical signal,
- phase-shifting the electrical signal,
- converting the phase-shifted electrical signal to an audio signal, and
- emitting the audio signal in close proximity to the data entry device.

17. (Original) A method according to Claim 15 wherein the step of generating comprises emitting pre-recorded sounds.

18. (Original) A method according to Claim 17 wherein the pre-recorded sounds are recorded sounds of random input to the data entry device.

19. (Original) A method according to Claim 15 wherein the step of generating comprises providing background noise to mask the sound waves emitted from the data entry device.

20. (Original) A method according to Claim 19 wherein the background noise is provided by a blower.

21. (Original) A method according to Claim 20 wherein the blower blows a stream of temperature-controlled air in proximity to the data entry device controlling the external temperature of the data entry device to reduce temperature differentials left in the data entry device by the user.



22. (Previously Presented) A method for protecting data entry to a data entry device from eavesdropping, wherein a signature of data entry comprises sound waves emitted from the data entry device, comprising:

masking the signature of data entry resulting from entry of data by a user of the data entry device so as to reduce the detectability of the signature through eavesdropping by providing a sound-dampening device on the data entry device.

23. (Previously Presented) A system for protecting data entry to a data entry device from eavesdropping comprising:

a data entry device, and

means for establishing the external temperature of the data entry device to reduce temperature differentials left in the data entry device by the user so as to mask a signature of entry resulting from entry of data by a user of the data entry device to reduce the detectability of a thermal signature by eavesdropping.

24. (Original) A system according to Claim 23 wherein the data entry device is a keyboard.

25. Cancelled.

26. (Previously Presented) A system according to Claim 23 wherein the means for establishing comprises a resistive heating source operably associated with the data entry device so as to maintain the external temperature in a range surrounding a predetermined setpoint.

27. (Original) A system according to Claim 26 wherein the resistive heat source comprises a heating element formed as part of the data entry device.

28. (Previously Presented) A system according to Claim 23 wherein the means for establishing comprises a radiant heat source operably associated with the data entry device so as to maintain the external temperature in a range surrounding a predetermined setpoint.

29. (Original) A system according to Claim 28 wherein the radiant heat source comprises an infrared emitting lamp which radiates heat in proximity to the data entry device.

30. (Previously Presented) A system according to Claim 23 wherein the means for establishing comprises a convection heat source operably associated with the data entry device so as to maintain the external temperature in a range surrounding a predetermined setpoint.

31. (Original) A system according to Claim 30 wherein the convection heat source comprises a blower which provides a stream of air in proximity to the data entry device.

32. (Previously Presented) A system according to Claim 23 wherein the means for establishing comprises a feedback control circuit which provides a closed loop feedback control of the temperature wherein the feedback control circuit comprises:

a temperature sensor operably associated with the data entry device so as to measure the external temperature of the data entry device, and

a control circuit operably associated with the temperature sensor and with means for controlling temperature so as to control the means for establishing the external temperature of the data entry device based on the sensed temperature.

33. Cancelled.

34. (Previously Presented) A system for protecting data entry to a data entry device from eavesdropping comprising:

a data entry device, and

means for generating an interfering sound pattern so as to reduce the detectability of sound waves emitted from the data entry device so as to mask a signature of data entry resulting from entry of data by a user of the data entry device to reduce the detectability of an audio signature by eavesdropping.

35. (Original) A system according to Claim 34 wherein the means for generating comprises a noise cancellation circuit which cancels the sound waves emitted by the data entry device wherein the noise cancellation circuit comprises:

a microphone operably associated with the data entry device so as to receive sound waves from the entry of data by a user into the data entry device,

a first converting means operably associated with the microphone so as to convert the sound waves into an electrical signal,

a phase-shifting means operably associated with the first converting means so as to shift the phase of the electrical signal to produce a phase-shifted electrical signal,

a second converting means operably associated with the phase-shifting means so as to convert the phase-shifted electrical signal to an audio signal, and

an emitting means operably associated with the second converting means so as to emit the audio signal in close proximity to the data entry device.

36. (Original) A system according to Claim 34 wherein the means for generating comprises a sound generator operably associated with the data entry device so as to generate an interfering sound pattern so as to reduce the detectability of the sound waves.

37. (Original) A system according to Claim 36 wherein the sound generator comprises a speaker which emits pre-recorded sounds.

38. (Previously Presented) A system for protecting data entry to a data entry device from eavesdropping comprising:

a data entry device, and

a sound generator comprising a speaker which emits pre-recorded sounds, the sounds configured to generate an interfering sound pattern so as to reduce the detectability of sound waves emitted from the data entry device so as to mask a signature of data entry resulting from entry of data by a user of the data entry device to reduce the detectability of an audio signature by eavesdropping,

wherein the pre-recorded sounds are recorded sounds of random input into the data entry device.

39. (Original) A system according to Claim 36 wherein the sound generator comprises a blower which disrupts the sound waves by blowing a stream of air in proximity to the data entry device.

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**EVIDENCE APPENDIX**

**NONE**

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**RELATED PROCEEDINGS APPENDIX**

**NONE**